

REMARKS

Claims 1 – 49 have been examined. Claims 1, 8, 15, 21, 22, 24, 26 – 29, 33, 35 – 39, and 43 – 47 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Pat. No. 6,406,148 (“Marshall”); Claims 1, 2, 8, 18, 21 – 24, 26 – 29, 34, 40, and 43 – 48 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Pat. No. 4,786,146 (“Ledebuhr”); Claims 21, 22, 24, 26, 33 – 40, and 42 – 48 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Pat. No. 5,327,229 (“Konno”); Claims 1, 2, 7, 8, 14, 16, 17, 21, 22, 24, 26 – 29, 32, 35 – 39, and 43 – 47 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Pat. No. 5,262,895 (“LaDuke”); Claim 13 stands rejected under 35 U.S.C. § 103(a) as unpatentable over LaDuke in view of Marshall; Claims 3 – 6, 9 – 12, 30, and 31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Ledebuhr; Claims 20, 25, 41, and 49 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Ledebuhr in view of EP 0520369 (“Mitsutake”); and Claims 1, 19, 21 – 24, 26 – 29, 35 – 39, and 42 – 47 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Pat. No. 6,398,363 (“Ho”).

1. Claims 1 – 17, 21 – 24, 26 – 33, 35 – 39, and 43 – 47

Independent Claims 1, 21, 35, and 43 have been amended to better define aspects of the invention. In particular, these amendments incorporate a variation of limitations previously recited respectively in Claims 20, 25, 41, and 49. Those claims have accordingly been canceled and Claims 18, 34, 40, and 48 have additionally been canceled for consistency with the amendments. The rejections of Claims 20, 25, 41, and 49 were made only under § 103(a) as unpatentable over Ledebuhr in view of Mitsutake, the Office Action remarking that “Mitsutake discloses an optical projector, wherein input light is split into complementary spectral regions, and the various light components are modulated by a plurality of light valves, each of which is disposed between a pair of complementary polarizers” (Office Action, p. 8).

Applicant respectfully disagrees with this characterization of Mitsutake. Fig. 5 of Mitsutake shows an arrangement in which light is initially linearly polarized by polarizing element 31. The liquid-crystal valves 57R, 57G, and 57B are disposed between a half-wave plate 51R, 51G, or 51B and a polarizer 58R, 58G, or 58B (Mitsutake, Col. 4, l. 44 – Col. 5, l. 2). Independent claims 1, 21, 35, and 43 now include language requiring the polarizers around the optical shutters to be complementary, but this is not the arrangement disclosed by Mitsutake. The half-wave plates 51 of Mitsutake acts to rotate the polarization of the linearly polarized light by 45° (*id.*, Col. 4, ll. 50 – 55), permitting modulation to occur as described by Mitsutake in connection with Fig. 1B (*see id.*, Col. 1, ll. 21 – 36). Since Mitsutake does not disclose the limitation, the amended claims are believed to be patentable. MPEP 2143.

Furthermore, it is noted that one of skill in the art would, in any event, have no motivation to modify Ledebuhr with the teaching of Mitsutake. Ledebuhr already discloses the use of polarizing prisms 12 and 46 to provide suitable polarization of light for interacting with liquid-crystal polarization switches 20, 22, and 24 (*see* Ledebuhr, Fig. 1, Col. 2, l. 39 – Col. 3, l. 10). The polarization of the light is intimately related to the manner in which the liquid-crystal polarization switches operate to effect the desired sequential color illumination (*see* Ledebuhr, Col. 3, ll. 30 – 40). The desired functionality is already achieved with this arrangement, and Ledebuhr identifies no deficiency with the extinction ratio. Applicants thus respectfully disagree with the assertion in the Office Action that adopting the arrangement of Mitsutake would achieve a better extinction ratio. Indeed, the polarization rotation effected by the half-wave plates 51 of Mitsutake, while enabling the retardation advantageously to be approximate the half-wavelength in Mitsutake (*see* Mitsutake, Col. 5, ll. 14 – 18), is not believed to provide any benefit for the sequential color illumination implemented by Ledebuhr.

In this context, Applicant additionally notes that the claimed arrangement mitigates the smearing of band-edge profiles that results from the use of interference filters at angles other than normal incidence (Application, p. 12, l. 29 – p. 13, l. 6), particularly in embodiments where the device and methods are to be used to sample relatively large spectral regions (*see id.*, p. 14, ll. 7 – 15). Such concerns are not recognized by Ledebuhr, which appears to teach the use of polarization only for effective interaction with the liquid-crystal polarization

switches 20, 22, and 24. Since there is no motivation to modify Ledebuhr as proposed, the claims are respectfully believed to be patentable. MPEP 2143.

2. Claims 19 and 42

Claims 19 and 42 have been written in independent form. Claim 19 stands rejected only under §103(a) as unpatentable over Ho, while Claim 42 stands rejected both under §103(a) as unpatentable over Ho and under §102(b) as anticipated by Konno.

Applicant respectfully disagrees that Ho teaches or suggests the limitations of Claims 19 or 42 related to spectral separation of beams having complementary polarizations. For example, with respect to Claim 19, Ho does not teach or suggest third and fourth interference-filter arrays with the recited limitations, nor does it teach or suggest any alternative structure for performing the functionality recited in Claim 42.

In addition, Applicant also respectfully disagrees that the Konno teaches or suggests the limitations of Claim 42 related to spectral separation of beams having complementary polarizations. While the Office Action notes that Konno teaches two arrays of color filters (Office Action, p. 4), its disclosure of the use of polarization is similar to that of Ledebuhr, with polarizing prisms 1 and 11 being analogous to polarizing prisms 12 and 46 of Ledebuhr and liquid-crystal polarizer switches 5 –7 being analogous to liquid-crystal polarization switches 20, 22 and 24 of Ledebuhr.

Since the limitations are not disclosed in the cited art, Claims 19 and 42 are respectfully believed to be patentable.

Appl. No. 10/782,341
Amdt. dated December 7, 2005
Reply to Office Action of September 15, 2005

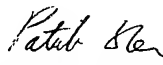
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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 303-571-4000.

Respectfully submitted,


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